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Contents: Noise and Hearing Conservation

Effective Date: **January 2004**

Point of Contact: [Noise and Hearing Subject Matter Expert](#)

Section

Overview of Content (see section for full process)

[Introduction](#)

[1. Planning Operations and Facilities Involving Noise Exposure](#)

- Minimize noise exposure in the planning stage.
- Include noise abatement in engineering design.
- Research noise ratings of future equipment installations.

[2. Evaluating Noise Hazards](#)

- Evaluate operations/areas that generate noise.
- Conduct assessment and complete written report.
- Maintain report.

[3. Controlling Noise Exposure](#)

- Implement controls.
- Use Personal Protective Equipment.

[4. Conducting Medical Surveillance](#)

- Complete baseline audiogram.
- Retest if results show an STS.
- If retest confirms an STS, see an otolaryngologist.
- Evaluate individual's operations and workplaces.
- Document and maintain records.

[5. Using Hearing Protection Equipment](#)

- Assess hearing conservation equipment needs.
- Complete training.
- Obtain equipment.
- Properly wear, maintain, clean, and store equipment.

[6. Contractor's Noise & Hearing Conservation Program](#)

- Assess job hazards.
- Monitor hearing protection program.

-
- Properly wear, maintain, clean, and store equipment.
 - Maintain documentation.

[Definitions](#)

Exhibits

[Noise Hazard Posting](#)

Forms

None

Training Requirements and Reporting Obligations

This subject area contains training requirements. See the [Training and Qualifications](#) Web Site.

This subject area does not contain reporting obligations.

References

29CFR1910.95: OSHA Occupational Noise Exposure

[Additional Medical Surveillance Form, Occupational Medicine](#) Web site

[Personal Protective Equipment](#) Subject Area

[Records Management](#) Subject Area

[Training and Qualifications](#) Web Site

[Work Planning and Control for Experiments and Operations](#) Subject Area

Standards of Performance

All staff and guests shall comply with applicable Laboratory policies, standards, and procedures, unless a formal variance is obtained.

All staff and users shall identify, evaluate, and control hazards in order to ensure that work is conducted safely and in a manner that protects the environment and the public.

All staff and users shall ensure that they are trained and qualified to carry out their assigned responsibilities, and shall inform their supervisor if they are assigned to perform work for which they are not properly trained or qualified.

Management System


This subject area belongs to the **Worker Safety and Health** management system.

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Introduction: Noise and Hearing Conservation

Effective Date: **January 2004**

Point of Contact: [Noise and Hearing Subject Matter Expert](#)

This subject area provides an overview of the Noise and Hearing Conservation Program and describes the procedures for implementing the regulatory requirements and exposure standards in OSHA Title 29 of the Code of Federal Regulations Part 1910.95 and the ACGIH (American Conference of Governmental Industrial Hygienists). It gives requirements to implement hearing conservation controls for work areas where noise levels exceed occupational exposure limits.

Every effort should be made at the planning stage to minimize noise exposure. The hazard potential of a given noise exposure depends on the intensity, frequency, and duration of exposure. Each of these factors is considered in determining which exposures are hazardous.

The BNL Noise and Hearing Conservation Program contains the following provisions:


- Investigating alternative control measures, including engineering and administrative controls;
- Evaluating the work conditions to prescribe the correct hearing protection equipment;
- Conducting medical monitoring;
- Training users and supervisors in the elements of the program and hearing conservation fundamentals.

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Subject Area: Noise and Hearing Conservation

1. Planning Operations and Facilities Involving Noise Exposure

Effective Date: **January 2004**

Point of Contact: [Noise and Hearing Subject Matter Expert](#)

Applicability

This information applies to BNL staff who plan operations and facilities that have the potential to cause hazardous noise exposure.

Required Procedure

Contact an [Industrial Hygiene Representative](#) or an [ES&H Coordinator](#) for assistance with this procedure.

Step 1	When new facilities or renovations are planned, evaluate potential noise exposures by consulting with Plant Engineering or other organizations on the design of buildings, machines, and layout of floor plans to minimize noise exposure to occupants.
Step 2	When acquiring equipment that has the potential to produce hazardous noise levels, if possible obtain noise ratings from manufacturers so that the lowest noise-generating equipment is selected. Contact an Industrial Hygiene Representative for assistance in this evaluation.
Step 3	When planning work where hazardous noise levels are anticipated, check "Noise" on the work planning and control documentation. See the Work Planning and Control for Experiments and Operations Subject Area. Ensure that an appropriate hazard assessment of the operation is conducted (see the section Evaluating Noise Hazards) addressing the following: <ul style="list-style-type: none"> • Potential engineering and administrative controls; • Personal Protective Equipment (PPE); • Exposure monitoring; • Medical surveillance.

References

[Work Planning and Control for Experiments and Operations](#) Subject Area


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2. Evaluating Noise Hazards

Effective Date: **January 2004**

Point of Contact: [Noise and Hearing Subject Matter Expert](#)

Applicability

This information applies to BNL staff who plan operations in areas that have the potential to cause hazardous noise exposure.

Required Procedure

Step 1	Supervisors or Staff determine from existing documentation or postings whether areas or operations have potential hazardous noise levels.
Step 2	<p>If there is no documentation or posting, the Work Planner, Supervisor, or Staff contacts the ES&H Coordinator or Designee to arrange for a noise survey and a written report of the assessment with recommendations.</p> <p>Note: A Facility Support Representative or Industrial Hygiene Service Representative performs these measurements.</p>
Step 3	<p>Staff performing the assessment, in conjunction with Line Management</p> <ul style="list-style-type: none"> Determine which engineering controls, administrative controls (e.g., postings, barriers) to use; Determine which Personal Protective Equipment (PPE) to use; and Document control measures in a hazard assessment report.
Step 4	Staff performing the assessment distribute the hazard assessment report to the Supervisor, ES&H Coordinator, Line Management, the Occupational Medicine Clinic, and the Industrial Hygiene Group.
Step 5	The Industrial Hygiene Group maintains the file of written hazard assessment reports and exposure monitoring records.
Step 6	When noise levels above the OSHA Action Level are measured in areas with the potential for employee exposure, the Staff Member performing the hazard

assessment, in conjunction with Line Management, determines the appropriate mechanism to demarcate the hazardous areas using signage or other effective mechanisms. See the exhibit [Noise Hazard Posting](#) for examples of acceptable wording for signs.

Guidelines

Contact your Supervisor, [Facility Support Representative](#), [Environmental Safety and Health Coordinator](#), [Work Control Managers/Coordinator](#), or [Industrial Hygiene Representative](#) for assistance.


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3. Controlling Noise Exposure

Effective Date: **January 2004**

Point of Contact: [Noise and Hearing Subject Matter Expert](#)

Applicability

This information applies to BNL staff who conduct operations in areas that have the potential to cause hazardous noise exposure.

Required Procedure

Step 1	If an uncharacterized work area has the potential for hazardous noise exposure, go to the section Evaluating Noise Hazards to determine the hazard and controls.
Step 2	If equipment is causing excessive noise exposure to employees, the Supervisor or Designee contacts Plant Engineering, or the equipment manufacturer for feasibility of implementing engineering controls, repairs, or modifications.
Step 3	In areas with high noise levels, the Supervisor or Designee implements the engineering and administrative controls, specified in the hazard assessment report in the section Evaluating Noise Hazards .
Step 4	<p>In areas with high noise levels, Staff follow administrative controls and use Personal Protective Hearing Equipment (specified in the hazard assessment report in the section Using Hearing Protection Equipment) or work planning and control for experiments and operations documentation.</p> <p>Note: See the section Using Hearing Protection Equipment and the Personal Protective Equipment Subject Area for more information on hearing protectors.</p>

Guidelines

Contact your Supervisor, [Facility Support Representative](#), [Environmental Safety and Health Coordinator](#), [Work Control Managers/Coordinator](#), or [Industrial Hygiene Representative](#) for assistance.

References

[Personal Protective Equipment](#) Subject Area


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4. Conducting Medical Surveillance

Effective Date: **January 2004**

Point of Contact: [Noise and Hearing Subject Matter Expert](#)

Applicability

This information applies to BNL staff who conduct medical surveillance.

Required Procedure

Step 1	<p>The Supervisor completes the Additional Medical Surveillance Form:</p> <ul style="list-style-type: none"> • As soon as possible after staff have their first occupational noise exposure at or above the OSHA Action Level (an 8-hr time weighted level of 85 dBA) on any day; • Annually for staff who continue to be exposed at or above the OSHA Action Level. <p>The Supervisor can complete the Additional Medical Surveillance Form for staff expected to be exposed at or above the OSHA Action Level on any day.</p>
Step 2	The Occupational Medicine Clinic (OMC) schedules and performs a baseline audiogram in response to this request.
Step 3	If an audiogram shows a Standard Threshold Shift (STS), then the individual is retested within 30 days.
Step 4	If the retest audiogram confirms an STS, then OMC refers the individual for an evaluation by an otolaryngologist.
Step 5	The OMC reviews the otolaryngologist's evaluation and notifies the Occupational Injury/Illness Coordinator if OMC determines that the STS is noise-induced.
Step 6	The Occupational Injury/Illness Coordinator requests that the Industrial Hygiene Representative conducts an evaluation of the individual's operations and/or workplaces for excessive noise exposure.

Step 7	The Industrial Hygiene Representative conducts, documents, and maintains records of the evaluation and transmits them to the Occupational Injury/Illness Coordinator, Line Management, and the individual.
Step 8	The Occupational Injury/Illness Coordinator records the STS as caused or aggravated by BNL occupational noise exposure.
Step 9	<p>Line Management ensures that the following steps are taken when a work-related STS occurs and potential exposure at or above the Action Level continues:</p> <ul style="list-style-type: none">• Staff not using hearing protection are fitted with hearing protectors, trained in their use and care, and required to use them.• Staff already using hearing protectors are refitted and retrained in the use of hearing protectors and provided with hearing protectors offering greater attenuation if necessary.

Guidelines

Contact your Supervisor, [Facility Support Representative](#), [Environmental Safety and Health Coordinator](#), [Work Control Managers/Coordinator](#), or [Industrial Hygiene Representative](#) for assistance.

References

[Additional Medical Surveillance Form, Occupational Medicine Clinic](#) Web site


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5. Using Hearing Protection Equipment

Effective Date: **January 2004**

Point of Contact: [Noise and Hearing Subject Matter Expert](#)

Applicability

This information applies to BNL staff who use hearing protection equipment.

Required Procedure

Step 1	Line Management and Staff select personal protective equipment (PPE) by <ul style="list-style-type: none">• Reviewing existing work planning & control, or other documentation that specifies hearing-protection equipment;• Contacting a Facility Support Representative, Industrial Hygiene Representative, or ESH Coordinator.
Step 2	Line Management ensures that all staff exposed to noise, (regardless of whether PPE is used) that is at or above the OSHA Action Level receive annual training that includes the proper use and care of hearing-protection devices. See the Training and Qualifications Web Site.
Step 3	Line Management provides hearing protection that is capable of reducing noise (e.g., earplugs or muffs). See the Personal Protective Equipment Subject Area for requirements on selecting and procuring PPE.
Step 4	Staff properly wears and maintains the equipment during the job, task, or project by <ul style="list-style-type: none">• Inspecting equipment before each donning;• Wearing the hearing-protection equipment in the manner specified in training and by the manufacturer.

	See the Personal Protective Equipment Subject Area for requirements on inspecting and maintaining PPE.
Step 5	Staff cleans and stores, or disposes of hearing-protection equipment after each use. See the Personal Protective Equipment Subject Area for more information.

Guidelines

- Hearing protection may be stored at the entrance of posted noise areas, but they need to be kept cleaned and protected. Ear plugs should not be re-worn between users. Ear muffs should be cleaned between users.
- Inform your Supervisor, [ESH Coordinator](#) or the [Noise and Hearing Subject Matter Expert](#) of any problems encountered in using the hearing-protection equipment or suggestions for improvements of the BNL program.

References

[Personal Protective Equipment](#) Subject Area

[Training and Qualifications](#) Web Site


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6. Contractor's Noise & Hearing Conservation Program

Effective Date: **January 2004**

Point of Contact: [Noise and Hearing Subject Matter Expert](#)

Applicability

This information applies to the BNL Contracting Organization and the Contractor when the project has the potential to meet or exceed the Action Level for noise.

Required Procedure

Step 1	The BNL Contracting Organization determines if the project has the potential to meet or exceed the Action Level as per the sections Planning Operations and Facilities Involving Noise Exposure and Evaluating Noise Hazards .
Step 2	<p>The BNL Contracting Organization</p> <ul style="list-style-type: none"> Specifies in the bid package that <ul style="list-style-type: none"> the contractor's and any subcontractor's programs must comply with 29CFR1910.95: OSHA Occupational Noise Exposure and American Conference of Governmental Industrial Hygienists, Inc. (ACGIH) Threshold Limit Values (TLVs); the contractor and any subcontractor provide all exposure monitoring data for the contracted work to the BNL Contracting Organization; Monitors the implementation of the hearing-protection program by the Contractor; Stops work by Contractors that fail to comply with their program.
Step 3	<p>The BNL Contracting Organization ensures that the Contractor's and Subcontractor's Health & Safety Plans address the following:</p> <ul style="list-style-type: none"> Employee exposure monitoring; Audiometric testing; Personal Protective Equipment (PPE) and its noise-reduction rating to adequately protect the Contractor's employees from noise hazards.

	adequately protect the Contractor's employee from noise hazards.
Step 4	<p>The BNL Contracting Organization ensures that the Contractor's workers properly wear and maintain PPE as per the Contractor's Health & Safety Plan, by</p> <ul style="list-style-type: none"> Periodically Inspecting the work site; Reviewing the Contractor's documentation on compliance.
Step 5	<p>For workers exposed at or above the OSHA Action Level, the BNL Contracting Organization ensures that the Contractor provides the BNL Contracting Organization with</p> <ul style="list-style-type: none"> Exposure monitoring data; Proof of an OSHA-compliant audiometric testing program; Proof of an OSHA-compliant Noise & Hearing Conservation Training Program.
Step 6	<p>The BNL Contracting Organization maintains Contractor's documentation provided in step 5 according to the Records Management Subject Area.</p>

References

[Records Management](#) Subject Area

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Noise Hazard Posting

Signs are one way to help staff take proper precautions in areas with noise hazards.

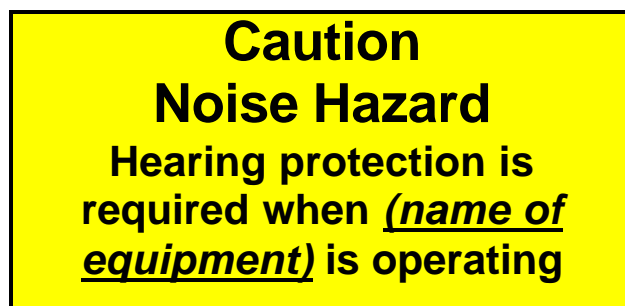
- All areas or operations with noise exposure to employees above 85 dBA should be posted.
- The signs should be prominently posted.


The recommended wording for noise hazards posting are as follows:

- A. Where the noise level is frequently or constantly above acceptable limits



- B. Where the noise level is intermittently raised above acceptable limits **by a piece of equipment**





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Definitions: Noise and Hearing Conservation

Effective Date: **January 2004**

Point of Contact: [Noise and Hearing Subject Matter Expert](#)

Term	Definition
Action Level, OSHA	8-hour Time Weighted Average (TWA) of 85dBA.
administrative controls	<p>A procedure exercised by a supervisor for protecting staff from hazardous noise levels by limiting their exposure time. Such procedures may include</p> <ul style="list-style-type: none"> Reducing exposure time; Posting warning signs at entrances and/or at the periphery of areas where there is sustained noise in excess of the limits.
audiogram	A chart or table showing a person's hearing level at various noise frequencies.
audiometric testing	Evaluation of an individual's hearing, using audiograms and other elements in a program in full compliance with 29CFR 1910.95 (g).
BNL contracting organization	A BNL Organization who administers a contract to a non-BNL Contractor to perform work in a high noise area or perform an operation that will produce high noise exposure levels to BNL employees or the Contractor's employees.
decibel (dB)	A nondimensional unit used to express sound pressure levels. It is the log of the ratio of the measured sound pressure level to a reference level.
ear muff	A personal hearing protector that fits over the entire ear, snug against the head.
ear plug	A personal hearing protector that is inserted into the external ear canal.
engineering controls	A means of protecting personnel from hazardous noise levels by reducing the noise before it reaches the exposed individual. Such methods may include


	<ul style="list-style-type: none">• Alternative equipment design;• Vibration isolation;• Dampening enclosures/barriers.
hazardous noise exposure	An employee exposure that exceeds an 8-hour Time Weighted Average (TWA) of 85dBA.
noise area	Area where noise routinely meets or exceeds the Action Level.
Noise Reduction Rating (NRR)	An approximation of the reduction in the noise level that will enter a person's ear when a hearing protector is worn.
Standard Threshold Shift (STS)	Change in hearing threshold relative to the baseline audiogram of an average of 10dB or more at 2000, 3000, and 4000 Hz in either ear.

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Revision History: Noise and Hearing Conservation

Point of Contact: [Noise and Hearing Subject Matter Expert](#)

Revision History of this Subject Area

Date	Description	Management System
January 2004	<p>This subject area provides an overview of the Noise and Hearing Conservation Program and describes the procedures for implementing the regulatory requirements. It gives requirements on operations to implement hearing conservation controls for work areas where noise levels exceed occupational exposure limits.</p> <p>This subject area replaces ES&H Standard 2.4.0, Noise.</p>	Worker Safety and Health

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